



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,477	02/23/2004	Subbareddy Kanagasabapathy	52018	9336

21874 7590 05/17/2005

EDWARDS & ANGELL, LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
----------	--------------

1752

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/786,477

Applicant(s)

KANAGASABAPATHY ET AL.

Examiner

Yvette C. Thornton

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10282004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This is written in reference to application number 10/786,477 filed on February 23, 2004 and published as US 2004/0224255 A1 on November 11, 2004.

Priority

1. Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged.

Information Disclosure Statement

2. The Information Disclosure Statement(s) filed on October 28, 2004 has/(have) been entered and fully considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

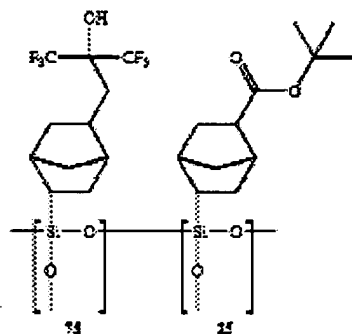
4. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Sooriyakumaran et al. (US 2002/0090572 A1). Example 2 of Sooriyakumaran exemplifies the synthesis of poly[2-hydroxy-3,3,3-trifluoropropylsilsesquioxane-co-5-(2-trimethylsilylethoxycarbonyl)norbornyl silsesquioxane] in a ratio of 90:10 (p. 0102-0105). See also examples 1 and 3-6. The said polymer was then admixed with a photoacid generator and a solvent to form a photoimageable composition (ex. 6; p. 0115). It is the examiner's position that the taught polymer has a ratio of fluorine to silicon of approximately 1.0, which meets the requirements of instant claim 1 and 2. Example 10 teaches a silicon substrate coated with an organic underlayer and baked. The said underlayer was overcoated with the

Art Unit: 1752

composition of example 6 and baked to form a resist film. The said film was then exposed, baked and developed to form a high-resolution image (p. 0119). Examples 11 and 12 exemplify a negative working system (p. 0120-0122), thereby meeting the limitations of instant claim 7. It is the examiner's position that the taught organic underlayer of example 10 meets the limitations of a polymer composition coating layer set forth in instant claims 9 and 10.

Sooriyakumaran further teaches that the polymer and copolymer of the taught invention may also comprise other suitable monomers such as hydroxystyrene to enhance development and etch resistance or silicon-containing monomer unit to enhance oxygen plasma etch resistance for bilayer applications. For use in 157 nm lithography, fluorinated comonomers are preferred (p. 0061). Although not exemplified, one of ordinary skill in the art would readily envisage a polymer similar to the poly[2-hydroxy-3,3,3-trifluoropropylsilanesquioxane-co-5-(2-trimethylsilylethoxycarbonyl)norbornyl silsesquioxane] exemplified in example 2 further comprising a silicon containing monomer or a fluorinated comonomer such as silicon-containing (meth)acrylate, silicon-containing styrene or fluorinated (meth)acrylic acid esters as taught by the disclosure of Sooriyakumaran (p. 0061).

5. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Barclay et al. (US 2004/0265754 A1). Barclay exemplifies the synthesis of a polymer having the following formula:



(p. 0122-0126). The said polymer has a F:Si ratio of 3. Example 6

exemplifies the use of a resist composition comprising the polymer of example 2 and a photoactive component. The said composition was coated onto of an underlayer composition (see ex. 1) and baked,

Art Unit: 1752

exposed and developed to form an image (p. 0149-0152). Example 5 pertains to a negative working system (p. 0139-0148). See also p. 0058.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- Gronbeck et al. (US 6803171 B2) pertaining to a photoimageable composition.
- Cameron et al. (US 2004/0253535 A1) pertaining to a multilayer photoresist system.
- Kanagasabapathy et al. (US 2004/0161698 A1) pertaining to photoresists containing sulfonamide component.
- Kanagasabapathy et al. (US 2004/0229159 A1) pertaining to fluorinated silicon polymers.
- Barclay et al. (US 2004/0209187 A1) pertaining to photoresists containing Si-polymers.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 571-272-1336. The examiner can normally be reached on Monday-Thursday 8-6:30.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1752

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Yvette Clarke Thornton
Primary Examiner
Art Unit 1752

yct
May 12, 2005